Volume 310, number 1, 88–98 FEBS 11549 September 1992

Book Reviews

Metallothionein and related molecules (Methods in Enzymology, Vol. 205: Metallobiochemistry, Part B); Edited by James F. Riordan and Bert L. Vallee; Academic Press; San Diego, 1991; xxxiii + 681 pages. $90.00

Very few proteins have volumes of Methods in Enzymology dedicated to them. There are several reasons why metallothioneins deserve this distinction.

The term metallothionein now encompasses a structurally diverse group of molecules, defined in chapter 2. While class I and II metallothioneins are gene encoded, class III metallothioneins are not. Chapters describing the analysis of all three classes are included. All of these molecules possess sufficient unusual features (and hence pitfalls for the uninitiated experimentalist) to justify a dedicated methodological text. This volume includes methods for the detection, quantification and isolation of all classes of metallothionein along with ten chapters which outline techniques for their physicochemical characterisation. The methods used for the analysis of metallothionein genes, their regulation and function, are largely the same as the methods used for the analysis of any other gene. Therefore, this volume contains minimal reference to the extensive literature relating to the molecular biology of metallothioneins.

Following the purification of the first metallothionein from equine kidney cortex in 1957, the level of interest in these molecules has vacillated. A resurgence of interest, assured by coincident developments, has created a requirement for this volume. The biological functions of most metallothioneins remain ill-defined. In the introductory chapter to this book, Bert Vallee observes that roles proposed at inception included detoxification of cadmium and certain other metals, regulation of zinc and copper metabolism, and the provision of zinc for newly synthesised apoenzymes. While animal metallothionein has a high affinity for zinc, the associated metal is also highly labile, a necessary attribute for an intracellular zinc donor. In addition, Vallee notes that it was suggested that metallothionein may have a function in the expression of genetic information. The recent structural characterisation of zinc-fingers, zinc-twists and zinc-clusters in DNA-binding proteins has now led to the implication of animal metallothionein in the regulation of zinc homoeostasis as it relates to gene expression. Increased awareness of anthropogenic degradation of the environment has fostered growing concern about the fate of metals such as cadmium and mercury within the biosphere. This has been one catalyst for the analysis of metallothioneins in a wide spectrum of organisms from diverse environments and chapters describing the purification of metallothioneins from vertebrates, invertebrates, fungi, plants and cyanobacteria are all included. finally, the recent isolation of metallothionein genes from plants and prokaryotes has raised many new questions and provided the impetus for future studies in these organisms. The aforementioned factors have attracted a new cohort of experimentalists from different sub-disciplines within the biological sciences to the study of metallothioneins.

The opening and closing chapters of this book are reviews which summarise current knowledge about the structures and functions of metallothioneins. Several of the methodological chapters also describe results which are absent from the primary literature. This volume will further stimulate the study of metallothioneins by collating the latest methods for their analysis and providing detail generally absent from the primary literature. It is an essential manual for both new investigators attracted to the analysis of these molecules and for established 'metallothionein-laboratories'.

Nigel J. Robinson

Plasminogen Activators: From Cloning to Therapy; Edited by R. Abbate, T. Barni and A. Tsafriri; Raven Press, New York, 1991; xii + 204 pages. $75.00

Since the cloning of the cDNA for tissue plasminogen activator (t-PA) in 1983, there has been much interest in the use of this and related proteins in thrombolytic therapy. At the same time, the cell biology of the plasminogen–plasmin system was being investigated in detail, especially in relation to cancer and other disorders. These two major areas of research came together only infrequently. This volume presents the proceedings of a Serono symposium, held in Florence in October 1990, which brought together invited participants with wide-ranging interests in the plasminogen-plasmin system.

This book has a broad focus, covering the roles of the plasminogen activators, including urokinase (u-PA), in the processes of inflammation, embryology and oncology, in addition to a brief section on fibrinolysis. The first section of the book is on cloning, molecular forms and receptors and three chapters are devoted to the urokinase receptor. This reflects the enormous

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